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Teaching in an Inspiring Learning Space: an investigation of the extent to which one school's innovative learning environment has impacted on teachers' pedagogy and practice

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Abstract

In the design and development of new school buildings, areas equipped with state of the art technology and large, flexible spaces intended for collaborative teaching and learning are becoming increasingly common. This is in line with an understanding that this kind of learning environment reflects the contexts for work young learners are likely to meet and that such contexts enhance their learning experiences. By exploring teachers' thinking about the Inspiring Learning Space created in one school in Scotland, this paper explores how the space has invited teachers to consider their pedagogies in new ways, as well as some of the obstacles that have problematised their use of the space. Findings show that one of the key successes of the space has been in raising consciousness amongst teachers in relation to the ambitions and expectations of a skills-focussed curriculum, whilst allowing those who have chosen to use the space to explore the most meaningful and effective ways to engage learners there.

1. Introduction

In the design and development of new school buildings, areas equipped with state of the art technology and large, flexible spaces intended for collaborative teaching and learning are

becoming increasingly common. This is in line with an understanding that this kind of learning environment reflects the contexts for work young learners are likely to meet and that such contexts enhance their learning experiences. The skills they develop in learning environments like these are likely to be those needed in a rapidly changing society and economy{ CITATION The08 \l 2057 }. However, these kinds of learning environments, which have been described as an 'interventionist strategy with the potential to catalyse the systemic uptake of constructivist pedagogical practices in schools'{ CITATION Cle09 \p 386 \l 2057 }, are not without their challenges. There can be issues of teacher confidence and competence (Campbell, Saltmarsh, Chapman, & Drew, 2013; Clark & Zagarell, 2012; Deed & Lesko, 2015), issues relating to pupil engagement and its relationship to attainment { CITATION Bro11 \l 2057 } and problematisation around the affective and micro-political dimensions of teaching in spaces like these (Charteris, Smardon, & Nelson, 2017; Deed & Lesko, 2015; Mulcahy & Morrison, 2017). The 'assumption that changes in teaching and learning will occur as a result of new spaces'{CITATION Bra16 \p 75 \l 2057 } is one that requires considerable scrutiny.

1.1 The Historical Context

There have been a variety of spatial configurations for school buildings utilised over time, to meet the organisational and economic needs of the period in which they were created{ CITATION McN78 \l 2057 }. Arguably, the first 'open' designs, of the kind we recognise today, appeared in the 1940s. These were schools designed with increased circulation spaces, made to function flexibly as break-out locations for learning or for activities not feasible in a traditional classroom space. This compound use of space enabled financial rationalisation, with the gross area per pupil place being reduced over time through this mechanism { CITATION McN78 \l 2057 }. However, prior to this there had been considerable interest in learner-centred pedagogies and consideration of the spaces best suited to these. Key examples

include those advocated by Helen Parkhurst's Dalton system which originated at Dalton High School in Massachusetts in the 1920s (Bennett, et al., 1980; van der Ploeg, 2014) and Edward O'Neill of the Prestolee School in Lancashire throughout the first half of the twentieth century **{** CITATION Bur10 \l 2057 **}**. In both cases, recognition of the desirability of providing opportunities for learners to actively participate in their learning was an identifiable driver for practice. By the 1960s and 1970s, the coalition of suitably adaptable, open spaces for flexible learning and a cultural leaning towards progressive conceptions of what education can or should mean led to a much more widespread and conscious use of open plan designs in the United Kingdom (Bennett, et al., 1980; Delamont, 2014), as well as Australia, Canada and the United States**{** CITATION Mor79 \l 2057 **}**. In Scotland, the first open plan school was created in 1965, with a substantial number of new school buildings following suit in the decades that followed**{** CITATION Man82 \l 2057 **}**.

Yet, in spite of this auspicious beginning, the popularity of open plan school designs waned in the latter part of the twentieth century throughout the UK, with some theorising that parents, community organisations and the media found it problematic to relate to spaces for learning defined as 'open' or 'progressive', seeing these instead as 'permissive' and therefore socially undesirable**{** CITATION Ben78 \p 49 \l 2057 **}**. For teachers operating in these buildings, the expectation of collaborative practice with colleagues, originally conceived of as a positive and supportive aspect of teaching in open plan spaces, proved challenging too. Some teachers found the planning of cross-disciplinary courses and/or vertical teaching structures too time-intensive**{** CITATION McM83 \l 2057 **}**. This is a challenge still facing teachers planning for collaborative work in non-traditional teaching spaces today**{** CITATION Jon08 \l 2057 **}**.

The resurgence of interest in open plan designs for learning in the twenty-first century goes hand in hand with the foregrounding of process-based curricula in recent decades and the

pervasive personal and social technologies that have become so essential to life and the workplace (Ananiadou & Claro, 2009; Kicirkova & Littleton, 2017; Theisens, et al., 2008). How this relates to configurations of space for teaching and learning will be explored in greater detail below.

1.2 The Curricular Context

For centuries prior to the establishment of Scotland's devolved parliament in 1997, Scotland's education system operated independently of the rest of the United Kingdom**{** CITATION Mac84 \l 2057 **}**. In Scotland, secondary education begins after 7 years of primary education, with pupils arriving at secondary school around the age of 12 and remaining for four years of compulsory education, with a further two years optional for those aiming to access higher education. Scotland has its own curriculum and examination system, both of which have undergone significant changes in recent decades, as Scotland has shifted from an outcome-focussed curriculum to a process-focussed one **{** CITATION Pri10 \l 2057 **}**, known as A Curriculum for Excellence.

Based on a world-wide review of innovative developments for teaching and learning, the Organisation for Economic Co-operation and Development (OECD) has suggested the principles of learning in innovative environments can be defined by a range of characteristics, namely; recognising learners' ability to self-regulate their participation and engagement in their learning, providing opportunities for meaningful co-operative and collaborative learning, supportive teachers capable of motivating learners, sensitivity to individuals' learning needs, programmes of learning that are challenging, an emphasis on formative assessment, and opportunities for interdisciplinary learning that connects the spheres of study and personal interest **{**CITATION Org13 \l 2057 **}**. This ties in with the view that curriculum policy reforms around the world in recent years, including Scotland's Curriculum for Excellence, have been united by some key goals. These encompass the drive for curriculum

to play a more significant part in shaping and enhancing teachers' practice, and for curriculum to be pertinent to millennial learners, whose employment prospects and contexts are unpredictable **{** CITATION Sin13 \l 2057 **}**.

These principles are mirrored in the ethos and values of A Curriculum for Excellence, Scotland's national curriculum for learners from 3 – 18 years old, which describes itself as a 'flexible and enriched curriculum' that will lead to 'improved quality of learning and teaching' and encompass 'those who need additional support in their learning' **{**CITATION The081 \p 3 \l 2057 **}**. The curriculum is intended to 'strike a better balance' between 'equipping [learners] with the skills for passing exams and skills for learning, skills for life and skills for work' **{**CITATION The081 \p 8 \l 2057 **}**. In response to these curriculum developments, explicit attention has been drawn to buildings and infrastructure for learning and there is an implicit understanding that creating spaces for learning that can allow these skills to be better developed is a pivotal force in raising young learners' educational engagement and attainment (The Scottish Government, 2007; 2009a) though there is, as yet, a paucity of evidence to support this claim.

While this focus on learners and their needs is understandable and commendable, there remains the question of how these curriculum developments and expectations have impacted on teachers and what opportunities and challenges innovative learning environments offer for their thinking and the way they teach. Curriculum reform has meant a significant change of focus for Scottish teachers. In contrast to the previous tradition of content-based knowledge transmission, A Curriculum for Excellence relies on school-based curriculum development **{** CITATION Pri141 \l 2057 **}** that gives a new emphasis to learning experiences, which may be used to gauge learners' progress alongside more familiar learning outcomes, and privileges 'acquisition of generic, transferable skills over the retention of information'**{**

CITATION Ree13 \p 38 \l 2057 **}**. A requirement for longer-serving teachers to continuously develop their pedagogical knowledge in tandem with the expectation they will make use of innovative learning environments creates the potential for a disorienting professional milieu. The need for alignment between pedagogical practice and teaching environment is a core concern here. The value of alternative spaces for teaching is only of benefit if teachers recognise and can adapt their practice to use such spaces effectively. Therefore, it is an issue that engages with perceptions of the quality of educational provision available to learners within the setting **{** CITATION Mer17 \l 2057 **}**.

1.3 Literature Review

Discussion and research around so called 21st century skills suggest that this is a broad and fluid categorisation, encompassing a range of ideas, including communication skills, information management, collaboration skills, critical thinking, independent learning, problem solving and creativity. These are in addition to the digital skills which are often argued to underpin all the others in a socially networked environment (Ananiadou & Claro, 2009; Chu, Reynolds, Tavares, Notari, & Lee, 2017; Crockett, Jukes, & Churches, 2011; van Laar, van Deursen, van Dijk, & de Haan, et al., 2017; Voogt & Pareja Roblin, 2012). The increasing pressure for national curricula to encourage the development of these skills and competences has seen a growth in interest in the kinds of spaces that can facilitate this (Brooks, 2011; 2012; Cleveland, 2009; Deed & Lesko, 2015; Kuuskorpi & Cabellos González, 2011; OECD, 2013).

The relationship between spaces for teaching and pedagogies aligned with these is, for many teachers, a limiting factor on their teaching habits and choices (Campbell, et al., 2013; Tondeur, Herman, De Buck, & Triquet, 2017). In older school buildings created to service

the needs of an industrial society, spatial configurations are uniform and designed to facilitate the transmission of knowledge, whereas in an era of digital proliferation, pedagogy needs to 'more fully leverage learner agency and motivational capacity' (Chu, et al., 2017, p.3), requiring teachers to engage creatively with the development of their own professionalism **{** CITATION Cam18 \l 2057 **}** in order to meet changing the demands of societies and the educational curricula designed to support them. Constructivist views of learning are positively aligned with the development of 21st century skills (Merriënboer, et al., 2017; Voogt & Pareja Roblin, 2012) and, as a consequence, it is argued that there is a need for teaching spaces to enable the kind of learner-centric culture that social constructivism advocates (Brooks, 2012; Kucirkova & Littleton, 2017; Kuuskorpi & Cabellos González, 2011; Merriënboer, et al., 2017).

Constructivist theories of learning**{** CITATION Bru61 \l 2057 **}** advocate the importance of learners creating their own knowledge through both individual exploration and social interactions. The object of learning, in such schemas, is that 'students understand concepts and principles of a domain and develop productive habits of mind that support productive and generative use of concepts and principles'**{**CITATION Gre \p 132 \l 2057 **}**, as opposed to receiving prescribed knowledge or becoming practised in pre-approved procedural skills. In such schemas, it is recognised that the teacher's intentions are only one part of the drive for learning, since 'learners also have intentions'**{**CITATION Gre \p 133 \l 2057 **}**, which may or may not align with those of teachers. Two key responses geared towards meeting the needs of social constructivism in learning are 1) the provision of spaces where social forms of learning, such as collaborative problem solving and project-based learning, are encouraged through flexible layout and furniture, and 2) the provision of technology to facilitate 'customized learning'**{**CITATION Miy14 \p 434 \l 2057 **}** that meets the needs of every individual. The perception that these two forms of provision will complementarily meet the

requirements of learners developing 21st century skills is an increasingly pervasive one (Miyake & Kirschner, 2014; OECD, 2013; Theisens, et al., 2008).

The configuration of innovative teaching spaces, spacious, flexible and highly specified with technology, is directly linked with the expectation that they will be utilised not only as social learning spaces but also for collaborative teaching (Bradbeer, 2016; OECD, 2013). The rationale for this draws together benefits for both teachers and learners. Benefits of teacher collaboration for teachers include professional growth**{** CITATION Ryt12 \l 2057 **}**, an enhanced sense of belonging to a professional community and reduced sense of workplace isolation (Carpenter II, Crawford, & Walden., 2007; Thousand, Villa, & Nevin., 2006) but this requires a democratic attitude to sharing responsibility and accountability **{** CITATION Jon08 \l 2057 **}** that, in some cases, chafes and causes a high level of resistance in teachers accustomed to exclusive leadership and control of their lessons (Blanchard, 2012; Deed & Lesko, 2015). For learners, co-teaching provides diverse sources of knowledge and expertise, as well as effectively demonstrating the kind of collaborative skills that many of these process-based curricula ask pupils to work with (Little & Hoel, 2011; Thousand, et al., 2006). The repositioning of foci of authority has the potential to empower the learner, encouraging autonomous learning and intrinsic motivation**{** CITATION Lim12 \l 2057 **}**, as well as creating more positive learners' perceptions of the learning environment (Baepler, Walker, & Driessen, 2014) and better relationships between learners (Baepler & Walker, 2014). In addition, greater access to teachers provides a more settled and focussed lesson where learners' queries can be more quickly addressed, allowing them to move forward with their learning (Thousand, et al., 2006; Jones, Michael, Mandala, & Colachico, 2008). Yet, in spite of such benefits, the provision of a teaching space designed with collaborative teaching in mind is not necessarily sufficient to alter teachers' practice **{**CITATION Alt13 \l 2057 **}**. Considering teaching spaces as socially constructed and contested sites, where teachers' - and

learners' - identities are in constant flux, enables us to visualise collaborative teaching spaces as 'inherently more complex'{CITATION Bra16 \p 79 \l 2057 } locations for teachers' practice, dealing, as they must, with issues around peer judgements, authority and professional autonomy (Campbell, et al., 2013; Deed & Lesko, 2015; Mulcahy & Morrison, 2017; Rytivaara & Kershner, 2012). The additional practical concern of the need for planning time to set up effective collaborative teaching{ CITATION Jon08 \l 2057 } may also be a factor in affecting opportunities for teachers to teach together.

The issue of teachers' integration of technologies into their pedagogy is another area of core concern in relation to their use of innovative learning spaces. Technology integration in education generally has been an ongoing area of research interest (See for example Kozma, 2003; Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2016), with research showing that a range of factors contribute to whether teachers can and do, or cannot and do not, embrace technology as part of their daily work with learners{ CITATION Cla12 \l 2057 }. Perceptions of risk and value affect teachers' practice { CITATION How13 \l 2057 } along with affective, cultural and policy-related concerns (Charteris, et al., 2017; Ertmer & Ottenbreit-Leftwich, 2010; Mulcahy & Morrison, 2017; Mumtaz 2000). Additionally, debate surrounds the issue of whether technologies are genuinely effective in raising attainment and how technologies are allied with 'new' pedagogies relating to the development of 21st century skills { CITATION Liv12 \l 2057 }.

The anticipated impact of new learning environments on teaching is articulated as enabling teachers to better meet the needs of learners working within A Curriculum for Excellence{ CITATION The07 \l 2057 }, enabling Scotland's young people to develop so that they can succeed in life and learning, as well as grow to participate in an economy{ CITATION The092 \l 2057 } that competes in a global market where skills are key{ CITATION Org13 \l 2057 }. Greater independence, resilience, autonomy and engagement with learning are some

of the core competences desired by the Scottish curriculum, which aims to see every child become a successful learner, confident individual, responsible citizen and effective contributor within their own community (Priestley, et al., 2014; The Scottish Government, 2008). A move away from teacher-centred, transmission pedagogies to those which encourage learners to develop and explore their own interests may be one means of achieving these objectives.

1.4 Research Questions

One of the intentions underlying the funding of the range of Inspiring Learning Space projects across Scotland has been articulated as a 'trial' of 'new kinds of learning space to better inform forthcoming new-build schools'**{**CITATION Sco17 \p 4 \l 2057 **}**. In the case of this particular school, the design of the new building was already complete and construction in its preliminary stages by the time their ILS became available for use. In this instance, the ILS was conceived of as a means of encouraging teachers and learners to explore new and different ways of teaching and learning, to prepare them for the more flexible design of the new building. The school's leadership team and local authority wanted to know whether this intention was being meaningfully realised by the space.

In order to explore this, the research questions guiding the teaching-focussed aspects of inquiry, upon which this paper is based, were threefold.

1) How have teachers' perceptions of the purpose and value of ILS developed over the course of the academic year in which it has been operational?
2) To what extent and in what ways has teachers' thinking about their pedagogical role and teaching practice developed during this period?

Findings for research questions 1 and 2 are visualised as facilitating effective understanding of research question 3, the overarching concern.

3) Has the ILS been successful in the objective of preparing teachers for their move to the new school and better engagement with the principles of A Curriculum for Excellence envisaged through the new building's design?

1.5 The School Context

The school in which this research took place is a suburban secondary school in Scotland's central belt. The school had a roll of 731 in academic year 2016-17 when this research took place, with teaching complement of 66. The school is in an area of relative affluence, reported through Scottish Index of Multiple Deprivation data as being in the upper quartile for the local authority**{** CITATION The161 \l 2057 **}**. The school has one of the highest percentages of positive destinations for leavers in the local authority, at 95.6%, which is 2.2% above the local average**{** CITATION Ski15 \l 2057 **}**.

The local authority was awarded funding by the Scottish Government to create an Inspiring Learning Space. This funding enabled building work to take place, combining what had previously been three standard sized classrooms into one large L-shaped teaching space measuring 19 metres by 18 metres at its longest points. The funding was also used to equip the space with state of the art technology in the form of numerous Promethean interactive screens, to which pupils and staff can cast from their mobile phones or other personal technologies, and flexible fixtures and fittings to help facilitate learning. Much of the furniture is mobile (for example, there are beanbags and low stools to sit on) and multi-purpose (for example, tables coated with a dry-wipe writing surface that can flip vertically for presentation purposes) though there are also some built in booth-style tables and seating, each

equipped with its own interactive screen. Tablet computers and virtual reality goggles are also available for use in the space.

Part of the rationale for providing the school with the ILS was to acclimatise teaching staff to using such spaces as a regular feature of their pedagogy, encouraging them to embrace the ethos and purposes of the still relatively new Scottish curriculum. The existing school building will be replaced in the next academic year, with a number of similar flexible teaching spaces being a feature of the design of the new school.

The local authority funded an additional member of staff to supervise the smooth integration of the ILS into school life, to co-ordinate continuing professional development for staff and to act as a champion for the space. Numerous face-to-face professional learning opportunities were offered to staff during lunch hours and via after school sessions, including sessions with outside speakers. Online learning resources were made available to all staff. The co-ordinator also worked with subject leaders and departments to explore how to use the space effectively across a range of curricular areas.

The school opted to make the ILS a bookable space, available to any member of staff for use with their class or small groups of staff who wanted to use it for collaborative teaching. A detailed breakdown of usage was unavailable. However, anecdotally, the researcher was advised that usage of the space had been low to begin with but had increased over the first year, as teachers took opportunities to explore the space and familiarise themselves with the facilities. At the time of inquiry, limited collaborative or team teaching was understood to have taken place in the ILS, though simultaneous use of the space by multiple teachers with classes working separately had been a regular occurrence.

The school initially opted to allow senior pupils to have free access to the space, for use as a common room or study space whenever required. After the first few months of use, this was

revised so that senior students would only be allowed access to the space for purposes of study.

2. Method

2.1 Participants

All sixty-six members of the school's teaching staff were offered the opportunity to participate in the first phase of this research, an online questionnaire. Twelve participated (18% of staff). A select number of staff were then approached to ask if they would participate in face to face interviews. All six of those invited agreed. For both phases of research, participation was voluntary and all participants were assured of their anonymity, as well as being informed about the purpose of the research.

The participants were all teaching staff, one a middle manager and one with a senior management role. These teachers' subject specialisms included Art and Design, Computing, English, Mathematics, Modern Languages, Physical Education, Science, and Religious, Moral and Philosophical Studies. The teachers who participated varied in their levels of experience in teaching, from less than 5 years to 36 - 40 years. For the purposes of reporting responses here, questionnaire participants have been randomly designated as Teachers A through to L. Interview participants have been designated as Teachers M through to R.

Of the twelve teachers who completed the questionnaire, three had not made use of the ILS for their teaching. Of the six teachers were interviewed, two had not made use of the ILS in their teaching. Two teachers completed both questionnaire and interview, though their responses have been treated separately for the purposes of reporting findings here. No duplication has been permitted in the reporting of results from the dual participants. All

participants had seen the space, were aware of its availability and had been offered professional learning opportunities to support their use of the space for teaching.

2.2 Instrument

This research was undertaken though a mixed methods approach **{** CITATION Swa17 \l 2057 **}**, by means of an online questionnaire and semi-structured interviews.

2.2.1 Questionnaire

The questionnaire was developed to gauge teachers' thinking in relation to a number of aspects of the ILS. These included:

a) teachers' evaluation of the effectiveness of the space for teaching and learning (linked to RQ1)

b) teachers' planning for teaching and learning in the space (linked to RQ2)

and

c) teachers' beliefs about, and use of, technology in the space (linked to RQs1 and 2).

Items were developed in discussion with the ILS co-ordinator and senior school management and related, in many cases, to their concerns, queries and observations about use of the space. The questionnaire utilised a range of question types, including open ended questions for subjective and individuated responses, as well as rated response questions, asking teachers to gauge their attitudes and perceptions in connection with the ILS and their work within it. Some rated response questions utilised a 7 point Likert scale, 1 indicating strong agreement with a given statement, 7 indicating strong disagreement. Others used an nominal scale such as, 'Always', 'Sometimes' and 'Never'.

Simple descriptive statistics are used to outline questionnaire results.

2.2.2 Interviews

Interviews were undertaken on a one-to-one basis, in a quiet room in the school, at a time chosen by participants. Duration in each case was around 30 minutes. Interviews were audio-recorded and transcribed by the researcher.

Interviews were semi-structured around four key areas of questioning, which were developed from the three research questions. These were;

a) introduction to and first impressions of the space (linked to RQ1),

b) understandings of the space's curricular and wider purposes (linked to RQ1),

c) factors encouraging or discouraging teachers' use of the space (linked to RQ2)

and

d) considerations relating to collaborative teaching in the space (linked to RQ2).

3. Results

3.1 Teachers' perceptions of the purpose and value of ILS

3.1.1 Purpose

When asked to explain their understanding of the purpose of the ILS and similar teaching spaces, participants' responses were divergent, suggesting no single or definitive sense of the space's purpose. However, teachers who had made use of the space were able to articulate their perceptions of the intentions underpinning such spaces clearly and in a number of cases referred specifically to their teaching practice in relation to their understanding.

Teacher O focussed on the potential of the space for enabling teachers to become more imaginative and resourceful in their practice, seeing the ILS as an opportunity to experiment with learning experiences, suggesting;

> '…it's about how we as teachers make the curriculum come to life in that space and I think that's where the space is just a blank canvas for a teacher to use their creativity.' (Teacher O)

This view maintains a sense of the teacher's essential role in planning learning experiences and implies a sense of traditional teaching spaces as lacking the flexibility to encourage this kind of resourceful pedagogy.

One participant focussed on the idea of self-regulated learning and developing learner resilience, seeing the purpose of the space as being primarily about encouraging learners to be less dependent on the teacher as a problem-solving resource;

> 'I guess what you are trying to do is encourage the kids to be a bit more independent, a bit more responsible … the focus goes away from the teacher a little bit and goes more on working collaboratively.' (Teacher M)

This perception endorses the ILS as a space for meeting each individual learner's needs in ways that are not so reliant on traditional methods of teacher support.

Teacher N argued that flexible learning spaces with technology such as the ILS are intended to facilitate learner-centred pedagogies;

> '…it's to look at different ways of teaching that are not traditional chalk and talk ways of teaching … I think the nature of the space automatically promotes active learning.' (Teacher N)

This view touches on that of Teacher M, insofar as it prioritises learning over teaching, setting the learner in an increasingly agentic position, altering (perhaps diminishing) the teacher's role in a way that focuses on maximising learners' engagement and participation in their learning.

Teacher Q expressed a view of the purpose of the ILS that was similarly learner-focussed, seeing the ILS as;

> '…a flexible space in which pupils in a class can have that extra bit of freedom to move around and work in different ways, whether its writing on the walls, writing on the tables, using the screens, the Promethean casting, using the technology and stuff, so of course it all about that and for pupils it's all about moving their learning into this new century where we're thinking about they're not restricted to writing in a jotter and writing everything down. In actual fact they can learn in lots and lots of different ways but for me it's about a kind of lesson for life for staff for pupils that things are changing, you know. That's a space where it's about flexibility, it's about adaptability. It's about, you know, messy teaching. It's about, yes, the kids are going to be a little bit noisy, they're going to be moving about, and it's not this strictly controlled environment but that doesn't mean that it's a bad thing because I think what that space really encourages and should encourage is about taking the control more away from the teacher…' (Teacher Q)

This perspective touches on the need for greater variety in learners' educational experiences and articulates an awareness of social as well as pedagogical change, identified as 'messy teaching'.

Teacher P's reasons for not making use of the space for teaching was concerned with precisely this issue. While able to imagine the potential benefits of the space, concern about loss of control is a significant factor:

> 'I can envision it. I just haven't got round to planning it into my lessons and getting past my fear of there's another class in there that will distract them. Their pals are going to be there and there's that less formal space where they could just be working round the corner but will they be looking at what I want them to look at when there's other people there and there's the distraction? I don't have direct control of them.' (Teacher P)

3.1.2 Value

In terms of recognising the value of the ILS for learning and teaching, questionnaire participants were largely positive about this (Table 1), though the area of greatest disparity – bringing out the best in learners – seems to suggest that these teachers perceive that learners are not always able to work to their optimal ability in the space.

[Insert Table 1 here.]

This concern, about pupil attitudes to working in the space, was a recurrent theme in both the questionnaire and interviews, in particular with reference to behaviour.

Pupils' reactions to the novelty of the ILS when they were first taken to work in the space, particularly in relation to beanbag seating, featured in several of the interview discussions:

> 'I don't think the beanbags are a good idea. The first thing kids do is run in and jump on them, pull the zip up and before you know it you've got beanbag [beans] all over the floor.' (Teacher N)

> ‘The first day was a disaster because they were all … em – I mean it was a good class – jumping on beanbags and there was one kid lying flat out doing nothing.’ (Teacher M)

In contrast, Teacher O argued that her worst fears about the behaviour and attitudes of pupils in the ILS were not realised. The anxiety that, ‘…they’re going to lie about on these beanbags all day and they’ll think that this is all a big skive’ was contrasted with an opposed reality:

> ‘The first few times we went into the space and I would say to them right get a seat wherever you like and they would all just go and sit at the tables, and I’m like oh my God, you don’t have to sit at a table but they would sit at a table, so it took a wee while to almost desensitise them to that…’ (Teacher O)

A further concern related to the supervisory role of the teacher, as a larger space which encourages pupils’ freedom of movement raises concerns about surveillance and behaviour management in a situation where one teacher is using the space alone. One participant commented that the size and L-shaped configuration of the space contributed to making it ‘difficult to keep an eye on some pupils’ (Teacher I). Another participant said that since ‘there is a large area to manage’ some pupils can be ‘difficult to control’ when working there (Teacher C).

Possibly relating to this, one participant indicated that the presence of pupils who were not members of their class (i.e. senior pupils using the space as a common room or personal study space) is sufficiently worrying that it ‘prohibits use by classes’ (Teacher G). This questionnaire response, whilst not explicit about why the presence of senior pupils is perceived to prohibit use, suggests that behaviour management and maintaining pupils’ focus may be a matter of concern for this teacher.

However, pupil attitudes to working in the space were also indicated as being a benefit, as this was seen as being overwhelmingly positive and having a direct impact on pupils' engagement with their learning. Repeated pupil requests to work in the ILS were identified by Teachers B, D, F, I and K as being evidence of learner enjoyment and engagement when working in the space. Teacher N argued that the opportunity to work in the ILS can operate effectively as a reward too; 'the classes like it - you can use it almost as a carrot for a class. If you do this we'll get along to the learning space one day.'

Additionally, given a range of statements, positive, negative and neutral, describing learner engagement in the ILS, four of the nine questionnaire participants who had experience of teaching in the ILS chose the statement 'Learners are usually more engaged and focused on their learning in the ILS than in other learning environments', two chose 'Learners appreciate the privilege of learning in the ILS and make best use of the space/resources/facilities', and two chose 'Learners are too busy enjoying working in the ILS to disengage from their learning'. One respondent chose 'Learners see learning in the ILS as a break from traditional learning and sometimes forget to focus'.

3.2 Teachers' thinking about their pedagogical role and teaching practice

3.2.1 Planning for Teaching and Learning in the ILS

Questionnaire participants were asked to gauge their approaches to aspects of planning and delivering lessons in the ILS (Table 2) as a way of exploring their thinking about how their role might change in a different kind of teaching space. A high proportion of these participants indicated that they utilise their standard teaching strategies and rules when working with learners in the space, suggesting that for these participants, approaches to and expectations of their teaching practice may not alter greatly in the ILS. However, two thirds

of participants said they plan for their ILS teaching differently to normal and the same proportion say their usual teaching methods apply in the ILS, which raises queries about these teachers' understandings of how to use the space effectively. If planning is perceived as different, the nature of this difference bears scrutiny, given that in a substantial proportion of cases teaching methods are perceived to remain the same.

[Insert Table 2 here.]

The issue of planning and lack of familiarity with the space was identified by one participant as a discouraging aspect of using the ILS:

> 'If that was my space, rather than going through the procedure of having to think about it, plan it, identify a lesson, book it – if that was my space, it would be second nature. … I can go off on tangents. I've got drawers full of stuff that I can, right, I can just find that model or that bit of kit. In a space that's not mine that I have to plan every single minute of… I couldn't do that... I've lost the spark, that spontaneity.' (Teacher P)

This traditional view of teaching, with the teacher at the centre, suggests that for some teachers, the knowledge-based, improvisational aspects of their role are, understandably, difficult to visualise in the ILS.

Interview participants' thinking about their pedagogical role was, in some cases, directly linked with their perceptions in connection with the purpose of the ILS. Seeing the teacher's role in the space as facilitating learner-centred pedagogies rather than being transmitter of knowledge was identified by Teachers M, N and Q, as indicated in section 3.1.1 above.

Teacher O explicitly identified the role of the teacher as necessarily changing to meet the needs of learners in a technologically pervasive society:

> 'Kids don't want to sit down with a jotter and a textbook. That's not how they want to learn. They can go onto YouTube and learn anything in two minutes, so we need to be thinking about what is the purpose of school …the role of a teacher is now totally different from what it used to be… the sage on the stage, you stood at the front and did all the stuff. Now my role as a teacher is very different. It's much more about a facilitator, I think. You know, you're coaching kids; you're pointing them in the right direction. They're finding out that knowledge for themselves.'

In some cases, the use of the space as a break for pupils from traditional content-focussed teaching was articulated (Teacher M, Teacher N), though in one case, the ability to make and unmake a traditional classroom setting through the flexibility of the furniture was also identified as a benefit:

> '…now that I'm becoming a wee bit more competent I would envisage myself going down there and doing a bit of [traditional] teaching there, which I generally haven't done. I've only done any teaching that's been related in my classroom and then taken them down [to the ILS] to do the activity. Now that I'm a bit more confident I would be happy to go down and do a bit of teaching on the boards. You can pull them all together and have like a mini classroom and then they can dissipate and do their own stuff. And you can pull them together at the end as well...' (Teacher M)

This participant makes clear links between having developed confidence through time and practice in the space and increasing willingness to develop teaching strategies that make varied, active and flexible use of the space.

3.2.2 Technology

Attitudes to the interactive digital technology available in the ILS suggested a variety of perceptions relating to this. For some interview respondents, networked digital capabilities were not the most important benefit of the space;

> 'I have never used really any of the technology there at all.' (Teacher M)

> 'For me the biggest benefit of the space is the space and not necessarily the technology…' (Teacher O)

However, there is a sense that using the space without making the most of the networked digital facilities available is to miss a fundamental aspect of what the space should offer, and there appears to be a desire to be able to use these aspects of the facilities confidently:

> 'The technology side of things, to be honest, I'm still getting to grips with it…' (Teacher N)

> 'I think we perhaps need a wee bit more babied than we have been through it because confidence isn't very high – but I think it will come…' (Teacher M)

Questionnaire participants also shared a desire to increase their knowledge of the digital facilities offered by the ILS (Table 3). This was supported by comments made by participants in response to the question 'What kind(s) of support would you find useful that you have not yet been offered?' where 'Technical support' (Teacher D), 'training on boards', 'linking phones' (Teacher G) and 'More on digital capabilities' (Teacher K) were noted.

[Insert Table 3 here.]

3.2.3 Collaboration, Peer Observation and Shared Use

Several issues were raised by participants regarding working with colleagues in the ILS through questionnaire responses. The first of these related to confidence in teaching in a non-traditional space. When asked what kind of support they would find useful that they had not yet been offered, Teachers A, E and I indicated that they would appreciate opportunities to see peer teachers using the space effectively, as a means of improving their own practice. Relatedly, Teacher C and Teacher L said they would find it supportive to explore team teaching and how to use the space with more than one class. Two teachers, B and F, said they found other classes using the ILS at the same time as theirs a challenge, as this can result in a noisy environment and a resulting lack of focus in learners. Teachers N, M, O and Q all mentioned the need for mutual professional respect when sharing the space with colleagues undertaking different work.

Only one of the interview participants was positive about having had the experience of working collaboratively with colleagues across multiple classes in the space through co-teaching, citing formative experiences as a young teacher in a previous employment as a source of this positivity. The importance of communication and a shared vision were at the core of effective co-teaching for this participant:

> 'I think if you're team teaching with someone that you know really well and you know what they're about, that real shared understanding, for me, it absolutely makes a difference.' (Teacher Q)

This view suggests that collaborative teaching in the ILS, for this participant, is most effective when developed voluntarily on the basis of mutual understanding and respect.

4. Discussion

Findings of this research provide some understanding of participating teachers' preparedness for better engagement with the principles of A Curriculum for Excellence in the new school, in line with the research aims and questions. While limitations of scale mean it is difficult to draw wider inferences, some useful conclusions can be drawn about the perceptions and attitudes of the participating teachers that may reflect something of the school's culture in relation to developing teachers' thinking and practice in connection with the ILS, and, by extension, with their efforts to meet the ambitions and expectations of the curriculum.

4.1 Shaping Teachers' Practice

The desire for the ILS and other spaces like it to shape teachers' practice in such a way as to enhance and evolve this to meet the needs of millennial learners (OECD, 2013; The Scottish Government 2007) appears to be developing to some extent in the teachers who participated in this research.

Participants' responses suggest a general awareness of the need for pedagogy suited to learning outcomes that are meaningful to learners' lives. However, the 'systemic uptake of constructivist pedagogical practices' **{** CITATION Cle09 \l 2057 **}** may yet be some way distant. Desire or willingness to make use of the space has not been universal amongst teaching staff, and those who do teach in the space vary significantly in their approaches and thinking about how to make most effective use of it, with some regarding it as a simple extension of their normal teaching environment, taking with them customary lesson planning habits and classroom management techniques.

4.2 Building 21st Century Skills

Teachers' responses relating to the use of the ILS for developing the skills for life, learning and work suggests that there is a perceived correlation between the space itself and the kind

of skills that can be effectively taught and learned there. A focus on constructivist pedagogy, encouraging social interactions and pupil-centred learning, is enabled by the increased space and flexible layout, as respondents here acknowledge. This resonates with previous research which suggests that configurations of space for teaching are indirectly causal of human behaviour within them, influencing choices and experiences within the space (Brooks, 2012; Tondeur, et al., 2017).

As part of the discourse of developing 21st century skills, integration of, and confidence with, technology in the ILS appears to be a source of concern for several teachers who participated in this research. Teachers who have both taught and not yet taught in the ILS indicated that developing confidence in making best use of the available technology was something with which they require further support. The implication, suggested by these findings and by previous studies{ CITATION Cla12 \l 2057 }, is that the technological provision in the ILS may be under-utilised at present, not due to any lack of desire on the part of teachers to use what is available but rather from a lack of training or development opportunities suited to their individual needs.

4.3 Professional Development

Methods of developing teachers' knowledge and pedagogical confidence for teaching in the ILS is a recurrent question raised by these findings. In addition to lacking confidence with the available technology (despite having been offered a range of professional learning opportunities), it is interesting to note that participants expressed extremely limited experience of collaborative teaching in a space the size of three standard classrooms. This contrasts with the stated desire of some for increased opportunities to witness other teachers using the space effectively. The potential of a space like the ILS to facilitate teachers'

professional development through team teaching or peer observation is significant. Part of the design ethos of such a large space is to enable learners to experience situations where they can see that teachers are learners too, engaged in personal and professional development and growth through interactions with other professionals**{** CITATION Lit11 \l 2057 **}**. It appears that this is something that has, so far, happened in very few cases in the ILS. Possible reasons for the lack of team teaching or peer observation may include structural barriers such as timetabling difficulties or lack of planning time, which is essential for effective collaborative teaching (Jones, et al., 2008), teachers' resistance to peer scrutiny **{** CITATION Dee15 \l 2057 **}** or a desire to maintain undivided authority**{**CITATION Bla12 \l 2057 **}**. This is an issue that requires considerable further scrutiny, beyond the scope of discussion here, and should form the basis of further research.

4.4 Action Points

While there is no definitively right or wrong practice for teaching in innovative learning spaces, it seems logical to hypothesise the need for pedagogy to be suited to environment **{** CITATION Mer17 \l 2057 **}**. For teachers to develop their pedagogies to enable most effective use of such spaces, experimentation and peer discussion has the potential to help build a supportive community to facilitate and encourage good practice.

If more widespread and effective use of the space is the desired outcome, then mandatory timetabling of the space across secondary school subjects may encourage teachers to familiarise themselves with the facilities available over a sequence of non-negotiable teaching slots there. This would allow opportunities for pedagogical experimentation and exploration, whilst simultaneously breaking down the affective and structural barriers that

may be contributing to some teachers' resistance to using the space (Charteris, et al., 2017; Deed & Lesko, 2015; Mulcahy & Morrison, 2017).

However, for such a strategy to be both meaningful and effective, planning time is required (Jones, et al., 2008). Making time available to facilitate both inter- and intra-departmental planning for collaborative teaching and assessment has the potential to stimulate a greater number of positive co-teaching experiences and allow for peer observation and the associated professional development that could ensue from this. Peer support through collaborative teaching has the potential not only to enhance pedagogy but also to provide differentiated professional learning relating to the various skills required for teaching in innovative spaces through the pooling of knowledge and experience (Chu, et al., 2017), including digital skills and use of technologies.

5. Conclusion

The creation of a 'stepping stone' innovative learning space, to encourage teachers and learners to engage with non-traditional ways of teaching and learning, opens up a discussion about 21st century pedagogies, for teachers and learners alike, that might otherwise have remained closed through the remaining months of the school's occupancy of their current building. A different kind of space enables new thinking and a range of different experiences that force practitioners to address their practice in novel ways (Brooks, 2012; Tondeur, et al., 2017), though perhaps with varying degrees of success. However, if consciousness-raising and engagement with said discussion was an objective of the creation of the space, then in this regard it has been largely successful.

Further exploration of the impact of the ILS on teachers' thinking about their pedagogy could be usefully explored in the period after the school has taken occupancy of the new building,

in order to investigate teachers' perceptions of the impact of the ILS on their use of similar spaces in the new school. This should be an aim of future research.

Bibliography

{ BIBLIOGRAPHY **}**

List of Tables

Table 1
Teachers perceptions of the value of teaching and learning in the ILS*

Statement	Always	Sometimes	Never
I think the ILS brings out the best in learners.	*5*	*4*	*0*
Working in the ILS is valuable for 21st century learners.	*7*	*2*	*0*
Teaching in the ILS inspires me professionally.	*8*	*1*	*0*
Teaching in the ILS challenges me professionally.	*9*	*0*	*0*

**completed by n=9 participants, who had experienced teaching in the ILS*

Table 2
Attitudes to and perceptions of planning for learning and teaching in the ILS.

Statement	Agree/ Strongly Agree	Neutral/ Disagree
I plan for my teaching in the ILS with particular care.	9 (100%)	0 (0%)
I plan for my teaching in the ILS differently to the way in which I plan for teaching in my normal teaching environment.	6 (66.6%)	3 (33.3%)
I can afford to be flexible in my planning for teaching in the ILS.	9 (100%)	0 (0%)
Pupils lead their own learning in the ILS, while I monitor and facilitate.	9 (100%)	0 (0%)
Normal teaching methods apply in the ILS.	6 (66.6%)	3 (33.3%)
Normal classroom rules apply in the ILS.	8 (88.8%)	1 (11.2%)

Table 3
Attitudes to and perceptions of technology in the ILS.

Statement	Agree/ Strongly Agree	Neutral/ Disagree
It is important that I am confident with using technology in order to teach in the ILS.	6 (66.6%)	3 (33.3%)
I would like training to help me be more confident using technology with learners in the ILS.	8 (88.8%)	1 (11.2%)
It is important I empower learners to use technology in the ILS.	7 (77.7%)	2 (22.3%)
It is important that I know as much as (or more than) learners about using technology in the ILS.	7 (77.7%)	2 (22.3%)
I find the technological resources in the ILS intimidating.	3 (33.3%)	6 (66.6%)
I am concerned I will be held responsible for any damage to technology in the ILS during teaching time there.	2 (22.2%)	7 (77.7%)